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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Mchlberg et al.

Serial No. 10/034,065

Filed: December 19, 2001

For: Barcode Single Laser Scanner
Targeting

§
§ Group Art Unit: 2876
§
§ Examiner: Kim, Ahshik
§
§
§

Commissioner for Patents
P.O. Box 1450
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By:

Jane M. Roberts
Jane M. Roberts

SUPPLEMENTAL APPEAL BRIEF (37 C.F.R. 41.37)

This brief is in furtherance of the Request for Reinstatement of Appeal, filed herewith.

The fees required under § 41.20(B)(2), and any required petition for extension of time
for filing this brief and fees therefore, are dealt with in the accompanying
TRANSMITTAL OF REQUEST FOR REINSTATEMENT OF APPEAL.

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REAL PARTY IN INTEREST

The real party in interest in this appeal is the following party: Storage Technology Corporation

RELATED APPEALS AND INTERFERENCES

With respect to other appeals or interferences that will directly affect, or be directly affected by, or have a bearing on the Board's decision in the pending appeal, there are no such appeals or interferences.

STATUS OF CLAIMS

A. TOTAL NUMBER OF CLAIMS IN APPLICATION

Claims in the application are: 1-34

B. STATUS OF ALL THE CLAIMS IN APPLICATION

1. Claims canceled: 12-14
2. Claims withdrawn from consideration but not canceled: none
3. Claims pending: 1-11 and 15-34
4. Claims allowed: none
5. Claims rejected: 1-11 and 15-34

C. CLAIMS ON APPEAL

The claims on appeal are: 1-11 and 15-34

STATUS OF AMENDMENTS

There are no amendments after final rejection. Therefore, Claims 1-11 and 15-34 on appeal herein are as amended in the Response to Office Action filed July 19, 2004.

SUMMARY OF CLAIMED SUBJECT MATTER

A. CLAIM 1 - INDEPENDENT

The subject matter of Claim 1 is directed to a robot comprising a configuration of components disposed to determine the location of a component with respect to a target associated with a library storage cell. This configuration is illustrated in **Figure 6** and described at page 11, line 12 through page 12, line 30, and usefully includes a barcode scan apparatus 602. The application teaches at page 11, lines 15-16 that scan apparatus 602 is affixed to a robot arm 110, shown in **Figure 3**. The application teaches at page 13, lines 10-11, that scan apparatus 602 is associated with a scan path 612. It is further taught, at page 11, lines 17-19 and page 12, lines 1-9, that scan apparatus 602 comprises a laser barcode scan engine 604 and an aperture 606, having an aperture opening 610. **Figure 6** shows aperture 606 comprising a number of walls positioned around scan engine 604, including two wall sections on opposing sides of aperture opening 610. The inner surfaces of these wall sections attenuate or reduce uncontrolled portions of the scan beam produced by scan engine 604, to provide scan apparatus 602 with a scan path having a scan width 612. More particularly, it is taught at page 12, lines 15-19, and shown by **Figure 6**, that these attenuation surfaces of aperture 606 are situated to reduce scan width, so that the scan width 612 is made uniform or non-variable. By making the scan width non-variable, these attenuation surfaces of aperture 606 form a controlled end of scan. Use of the controlled end of scan to determine the position of the robot arm 110 with respect to a target, and to thus determine the location of scan apparatus 602 and the attenuating surfaces of aperture 606, is described at page 12, lines 20-30.

B. CLAIM 15 - INDEPENDENT

The subject matter of Claim 15 is directed to a positional determination device. Respective components of the Claim 15 device are similar to those of Claim 1. Accordingly, the determination device of Claim 15 is likewise taught in the

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application at **Figure 6** and at page 11, lines 12 through page 12, line 30. Thus, the barcode scanner of Claim 15 may comprise scan apparatus 602, providing a scan path of scan width 612 and affixed to a moveable object such as robot arm 110. Scan apparatus 602 comprises scan engine 604 and aperture 606, wherein aperture 606 is provided with surfaces located to attenuate a beam produced by scan engine 604. At least one end of the scan path 612 resulting from the attenuated beam is thereby controlled by the attenuating surfaces, to form a controlled end of scan, and used to determine location of robot 110 with respect to a target or other external object.

C. CLAIM 16 - INDEPENDENT

The subject matter of Claim 16 is directed to a library storage system comprising a plurality of storage cells, at least some cells including a target, and further comprising a robot. **Figure 3** shows a plurality of tape cartridge storage cells 130. As described in the application at page 8, lines 4-20, **Figure 3** also shows a number of targets 300 included with a plurality of storage cells 130. The robot of Claim 16 is taught to include a barcode scanner, an attenuating surface and other features similar to those recited in Claim 1. Accordingly, the robot of Claim 16 is illustrated by **Figure 6** of Applicant's drawings, and described at page 11, line 12 through page 12, line 30 thereof.

D. CLAIM 23 - INDEPENDENT

The subject matter of Claim 23 is directed to a method for determining the position of a robot relative to a target. The application at page 11, lines 12-16, teaches that a barcode scan apparatus 602 can be mounted upon a robot arm 110, as camera vision system 360 shown in **Figure 3**, so that scanner or scan apparatus 602 moves in unison with robot 110. **Figure 3** also shows the robot arm 110 positioned for movement relative to a target 300. The application at page 12, lines 1-19, together with **Figure 6**, teaches that scan apparatus 602 includes a scan engine 604 that provides a scan path having a scan path width, and moves in a direction parallel to the direction of movement of robot 110, as shown in **Figure 6**. Scan apparatus 602 further includes an aperture 606 having attenuating surfaces to control the scan path

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width 612. The application at page 12, lines 22-27, teaches determining a first parallel position at which the target first becomes readable, and determining a second parallel position at which the target first becomes unreadable.

E. CLAIM 29-INDEPENDENT

The subject matter of Claim 29 is directed to a system for determining the position of a robot relative to a target. The application at page 11, lines 12-16, teaches that a barcode scan apparatus 602 can be mounted upon a robot arm 110, as shown in **Figure 3**. **Figure 3** also shows the robot arm 110 positioned for movement relative to a target 300. The application at page 12, lines 1-19, together with **Figure 6**, teaches that scan apparatus 602 includes a scan engine 604 that provides a scan path having a scan path width 612, and moves in a direction parallel to the direction of movement of the robot 110, as shown in **Figure 6**. Scan apparatus 602 further includes an aperture 606 having attenuating surfaces to control the width of the scan path. **Figure 1** shows robot arm 110 mounted for movement in and movable by a first means, comprising an array 120 described at page 7, lines 4-15. As shown in **Figure 6** and described at page 12, lines 22-27, second and third means for determining first and second parallel positions at which the target first becomes readable and then unreadable, respectively, comprise the left side of target 608, and the right side thereof.

GROUND OF REJECTION TO BE REVIEWED ON APPEAL**A. GROUND OF REJECTION 1 (Claims 1-11, 15 and 16-22)**

Claims 1-11, 15 and 16-22 stand rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement.

B. GROUND OF REJECTION 2 (Claims 23, 26, and 29)

Claims 23, 26 and 29 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,138,909, to Rockwell et al.

C. GROUND OF REJECTION 3 (Claims 24-25, 27-28, and 30-34)

Claims 24-25, 27-28 and 30-34 stand rejected under U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,138,909, to Rockwell et al.

ARGUMENT

A. **GROUND OF REJECTION 1 (Claims 1-11, 15 and 16-22)**

Claims 1-11, 15 and 16-22 stand rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement.

A.1. **Background of Reinstatement of Appeal**

On October 5, 2004, the Examiner mailed a final Office Action in the present application. In the final Office Action the Examiner took the following actions in regard to pending Claims 1-10 and 15-34:

- (1) Claims 1-10 and 15 were rejected under 35 U.S.C. § 112, first paragraph, for lack of enablement.
- (2) Claims 1-10 and 15 were also rejected under 35 U.S.C. § 112, second paragraph, as being indefinite.
- (3) Claims 16, 20-22, 23, 26 and 29 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,138,909, to Rockwell et al.
- (4) Claims 17-19, 24-25, 27-28 and 30-34 were rejected under 35 U.S.C. § 103(a) as being obvious in view of the Rockwell patent.

On December 22, 2004, Applicants filed a Notice of Appeal, to appeal the rejection of Applicants' pending claims. On February 15, 2005, Applicants filed an Appeal Brief, setting forth arguments to overcome all of the above rejections. All arguments and other comments of Applicants set forth in their Appeal Brief are incorporated herein by reference.

On June 6, 2005, the Examiner mailed a non-final Office Action in the present application. In the non-final Office Action the Examiner expressly withdrew the final Office Action of October 5, 2004. In addition, the Examiner took the following actions in regard to pending Claims 1-11 and 15-34:

- (1) Claims 1-11, 15 and 16-22 were rejected under 35 U.S.C. § 112, first paragraph, for lack of enablement.
- (2) Claims 23, 26 and 29 were rejected under 35 U.S.C. § 102(b) as

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being anticipated by the Rockwell patent.

(3) Claims 24-25, 27-28, and 30-34 were rejected under 35 U.S.C. § 103(a) as being obvious in view of the Rockwell patent.

A comparison of the respective actions of the final Office Action of October 5, 2004, and the Office Action of June 6, 2005 disclose the following:

(1) The previous rejection of Claims 1-10 and 15 under 35 U.S.C. 112, second paragraph, has now been withdrawn.

(2) The previous art rejections of Claims 16-22, that is, rejections under 35 U.S.C. § 102 or § 103 based on the Rockwell patent, have now been withdrawn.

(3) Claims 16-22, as well as Claim 11, are now rejected under 35 U.S.C. § 112, first paragraph, along with Claims 1-10 and 15. The reasons given for this rejection, in the Office Action of June 6, 2005, appear to be somewhat different than the reasons given in the previous final Office Action.

(4) The reasons given for rejecting Claims 23-34, under 35 U.S.C. § 102 and § 103 based on Rockwell, appear to be identical to the reasons for rejecting these claims in the previous final Office Action.

On August 26, 2005 and September 2, 2005, the Examiner and Applicants' attorney discussed the 35 U.S.C. § 112, first paragraph, rejection in the Office Action of June 6, 2005. The Examiner indicated that Claim 1 would overcome this 35 U.S.C. § 112 rejection if "attenuation surface" in line 7 of Claim 1 was replaced with "barcode scanner". Applicants, through their attorney, express appreciation to the Examiner for this action, and also for providing the opportunity for these discussions. However, the discussions did not result in any claims, with or without amendment, becoming allowable. Accordingly, after due consideration, Applicants determined that it was necessary to reinstate their Appeal.

A.2. Essential Elements of Claims 1, 15 and 16

Claim 1 of the present application reads as follows:

1. A robot, the robot comprising:
a barcode scanner with a scan path, wherein the barcode scanner is

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affixed to the robot;

an attenuation surface affixed to the barcode scanner, wherein the attenuation surface is located such that at least one end of the scan path of the barcode scanner is controlled by the attenuation surface to form a controlled end of scan, and wherein the controlled end of scan is used to determine a location of the attenuation surface with respect to a target associated with at least one storage cell within a storage library.

Applicants consider that it is essential to have the following terms and elements correctly understood, as such terms are taught and used in their specification and in Claims 1, 15 and 16:

- (1) attenuation surface
- (2) controlled end of scan
- (3) controlled end of scan used to determine a location of the attenuation surface with respect to a target

A.3. Teachings of Applicants' Specification in Support of Claims 1, 15 and 16

In making their invention, Applicants sought to provide a cartridge storage library, wherein a barcode laser scanner was used to position a robot arm in accessing storage locations. As taught in the application at page 11, lines 1-11, Applicants recognized that there could be significant benefits in using a barcode scanner for this purpose, such as scan engine 604 shown in Figure 6. However, Applicants also recognized that a barcode scan engine by itself would produce a scan beam having a width that was variable, or uncontrolled. At page 12, lines 9-15, the application states the following:

The flexure is a mechanical apparatus within the barcode scan engine that controls the movement of the mirror that reflects the laser light across an area. Since the flexure is mechanical, the movement of the robotic arm 110 during the calibration procedure will affect the flexure causing the scan width 612 to be variable.

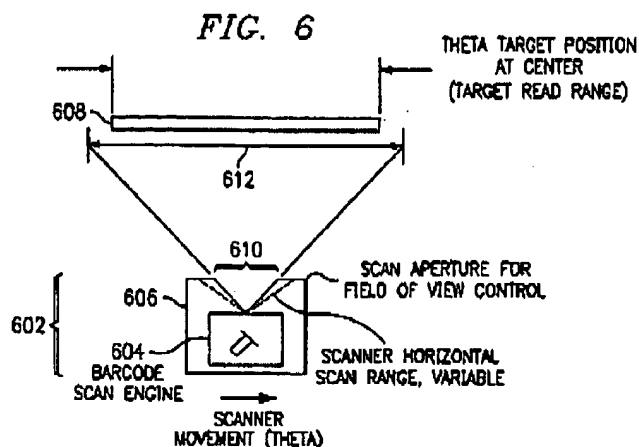
The application further teaches, at page 12, lines 1-4, that variable or uncontrolled width of the scan beam creates a serious problem in using a barcode scanner for Applicants' purpose:

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Furthermore, the scan width of the laser scanner beam from the barcode laser scanner is not controlled. Therefore, the proper calibration measurements cannot be made.

In accordance with their invention, Applicants solved this problem as taught in their application, such as at page 12, lines 4-9, page 12 lines 15-19, and **Figure 6** of their drawings, shown below. More particularly, Applicants contain or substantially enclose the laser barcode scan engine **604** in an aperture **606**, having an aperture opening **610**. The aperture opening **610** is sized to be selectively smaller than the width of the laser light beam produced by the scan engine **604**. As a result, the portion of the beam that passes outward through aperture opening **610**, for use in scanning a target **608**, has a scan width **612** that is uniform, or non-variable.

Referring further to **Figure 6**, there is shown aperture **606** comprising a number of walls positioned around scan engine **604**, including two wall sections positioned on opposing or opposite sides of aperture opening **610**. The inner surfaces of the two wall sections absorb, or otherwise attenuate or reduce the uncontrolled portion of the scan beam produced by scan engine **604**, in order to provide a scan path or scan width element **612** of non-variable width. **Figure 6** shows each of these attenuated uncontrolled beam portions depicted as a dashed line, directed from scan engine **604** to one of the inner surfaces of aperture **606**. One of these dashed lines is labeled "SCANNER HORIZONTAL SCAN RANGE, VARIABLE".



It will be readily apparent that each of these inner surfaces, of the two wall sections of aperture 606 adjacent to opening 610, compromises an attenuation surface. It is to be emphasized that each of these attenuation surfaces discloses and supports the attenuation surface recited in Claim 1, as well as in other claims of the application. Moreover, it is to be emphasized that these attenuation surfaces perform an essential function in achieving the purpose of Applicants' invention. For example, at page 12, lines 18-19, after describing the function of the aperture in reducing scan width, which is achieved by means of the attenuation surfaces as described above, the following is stated: "This produces a non-variable scan-width giving a controlled end of scan." (Emphasis added)

A further embodiment of the invention is disclosed at page 13, lines 18-30 of the application, together with Figure 9 reproduced below. Figure 9 depicts aperture 606 having two wall sections, above and below the aperture opening, respectively. The upper wall section is specifically referenced as "606". In this embodiment, the attenuation surfaces of the aperture wall sections are the sides of the wall sections that are oriented toward scan engine 604, that is, the left sides of the wall sections as viewed in Figure 9. At page 13, lines 23-27, it is taught that the surface of aperture 606 should be provided with a black anodized or black matt powder coating. It will

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be readily apparent that if the leftward surfaces of aperture 606 shown in **Figure 9** were provided with such black coating, such surfaces would be made particularly effective in absorbing, scattering or otherwise attenuating portions of the laser light scan beam produced by scan engine 604.

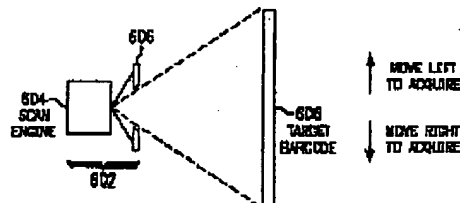


FIG. 9

It is thus seen that the present application teaches that the attenuation surfaces of aperture 606 operate to produce a non-variable scan width 612, and thereby provide a controlled end of scan. At page 12, lines 20-30, together with **Figure 6**, the application teaches how the controlled end of scan, or non-variable scan width, is used to determine a location of the attenuation surfaces, and also a location of the barcode scanner, with respect to the target 608. Such section of the application states the following:

To determine the center of the target in the direction parallel to the scan path, the robotic arm 110 is moved in the direction of scan path until the target 608 first becomes readable. This position is recorded through the use of a positional encoding device. The robotic arm 110 continues to move in the same direction until the target is no longer readable by the barcode scanner apparatus 602. This position is also recorded. The center of the target in the scan path direction is then the half distance position between these two positions.

Figure 6 shows a barcode scanner 602, comprising scan engine 604 and aperture 606 with its attenuation surfaces, disposed to move rightward as viewed in **Figure 6**. As scanner 602 moves to the right, the scan width element 612 generated thereby is able to read target 608. It is assumed that scanner 602 with its respective components is affixed to robotic arm 110, for movement in unison therewith.

Initially, robotic arm 110 and scanner 602 are positioned so that the right end of scan width element 612 is to the left of the left end of target 608. Scanner 602 is then moved to the right along its path. When the right end of element 612 reaches the left end of target 608, the target becomes readable, and this position is recorded. Then, when the left end of element 612 moves past the right end of target 608, the target becomes unreadable, and this position is also recorded. Because the width of the scan element 612 is non-variable, these two positions can be used to determine the location of the robotic arm, and thus the position of scan apparatus 602 and the location of the attenuation surfaces of aperture 606.

A.4. Examiner's Rejection of Claims 1-11, 15 and 16-22

In rejecting Applicants' Claims 1-11, 15 and 16-22 under 35 U.S.C. § 112, first paragraph, the Examiner stated the following:

4. Claims 1-10 and 15-22 are rejected under U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Re claims 1, 15, and 16, Examiner finds the following phrase difficult to comprehend. "an attenuation surface to the barcode scanner, wherein attenuation surface is located such that at least one end of scan path of the barcode scanner is controlled by the attenuation surface to form a controlled end of scan, and wherein the controlled end of scan, and wherein the controlled end of scan is used to determine a location of the attenuation surface with respect to a target associated with at least one storage cell within a storage library."

It is difficult to find whether attenuation surface is to determine a controlled end of scan or the controlled end of scan determines a location of attenuation surface. In a simplistic sense, if there are two variables which drive each other, actual operation may be in an infinite loop, never reaching the optimal scan path. However, Examiner respectfully request Applicant to clarify the claims or direct the Examiner in the specification if the subject matter actually functions as it is written in the claims.

Office Action dated June 6, 2005, pages 2-3

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A.5. Response to Rejection of Claims 1-11, 15 and 16-22

From the teachings of Applicants' specification discussed above, as well as other teachings of the application, key elements of Claim 1 can be summarized as follows:

- (1) The term controlled end of scan, as recited by Claim 1, is simply a condition that is equivalent to or results from a non-variable scan width 612, which is the width of the scanner beam from scanner 602. (See Applicants' specification, page 12, lines 18-19 and page 12, lines 1-2).
- (2) As recited by Claim 1, a controlled end of scan, and therefore a non-variable scan width, is required to determine location of an attenuation surface (as well as location of a barcode scanner affixed thereto) with respect to a target. (See Applicants' specification, page 12, lines 20-30 and **Figure 6** of Applicants' drawings).
- (3) The attenuation surface recited by Claim 1, such as inner surfaces of aperture 606 discussed above, reduces scan beam width, to provide a non-variable scan width, and thus "form a controlled end of scan". (See Applicants' specification, page 12, lines 15-19 and **Figure 6** of Applicants' drawings).

From the above comments of the Examiner, it appears that the only reason for rejecting Claim 1 under 35 U.S.C. § 112, first paragraph, is the Examiner's view that the Claim 1 recitations of "an attenuation surface to form a controlled end of scan" and "the controlled end of scan is used to determine the location of the attenuation surface" somehow are two variables which drive each other. However, Applicants consider it to be very clear that their application does not teach any such inter-related variables.

As discussed above, Claim 1 requires a controlled end of scan, and therefore a non-variable scan width of the scan path, in order to determine location. This essential controlled end of scan is formed by the attenuation surface. However, Claim

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1 also recites the attenuation surface to be affixed to the barcode scanner, which is in turn affixed to the robot. Moreover, Figure 6 shows the attenuation surfaces to be integral components of scan apparatus 602. Thus, the attenuation surface is in fixed relationship with barcode scanner 604, which provides the scan path of Claim 1. Accordingly, the attenuation surface moves in unison with the barcode scanner and the robot. At the same time, the fixed relationship between the attenuation surface and the barcode scanner is not affected by any such movements. It will thus be readily apparent that neither movement nor relocation affects operation of the attenuation surface of Claim 1, in forming the essential controlled end of scan. As a result, the controlled end of scan is always available, regardless of location of the attenuation surface, for use as described above to determine locations of the attenuation surface, the barcode scanner and the affixed robot.

For at least all the above reasons, Applicants consider the specification of their application to be fully enabling, as required by 35 U.S.C. § 112, first paragraph, in regard to their Claim 1.

Independent Claims 15 and 16 are directed to subject matter similar to that recited in Claim 1. Accordingly, Applicants consider their specification to be fully enabling in regard to Claims 15 and 16, for the same reasons given in support for Claim 1.

Claims 2-11 and 17-22 apparently were rejected under 35 U.S.C. § 112, first paragraph, only as being respectively dependent on Claims 1 and 16. Accordingly, Applicants consider their specification to be fully enabling in regard to Claims 2-11 and 17-22, for the same reasons given in support for Claims 1 and 16.

Therefore, it is believed that Applicants' specification is fully enabling, as required by 35 U.S.C. § 112, first paragraph, in regard to each of the Claims 1-11, 15 and 16-22. Accordingly, it is respectively requested that the Board reverse the Examiner's final rejection of those claims that is based on lack of enablement.

B. GROUND OF REJECTION 2 (Claims 23, 26 and 29)

Claims 23, 26 and 29 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,138,909, to Rockwell et al.

B.1. Examiner's Rejection of Claims 23, 26 and 29

The Office Action of June 6, 2005 rejects Claims 23, 26 and 29 under 35 U.S.C. § 102 (b) as being anticipated by (U.S. Patent No. 6,138,909) to Rockwell et al.

As to Claims 23, 26 and 29, the Office Action states:

Re claims 23, 26 and 29, Rockwell teaches a robot (see figure 1; col. 1, lines 26+) comprising a gripper 22, a barcode 28 affixed to the data cartridge processor 14 (col. 2, lines 35+), wherein the positional parameters are retrieved from the barcode (col. 3, lines 35+). Since the barcode is affixed on the surface of the cartridge processor 14, it can be said that the surface contributes in determining the scan path.

Office Action dated June 6, 2005, pages 3-4.

B.2. Response to Rejection of Claims 23, 26 and 29

Independent Claim 23 reads as follows:

23. A method for determining the position of a robot relative to a target, the method comprising:
moving a robot, having a barcode scan engine with a scan path having a scan path width controlled by an attenuation surface, in a direction substantially parallel to the scan path;
determining a first parallel position at which the target is first readable by the barcode scan engine; and
determining a second parallel position at which the target first becomes unreadable by the barcode scan engine. (emphasis added)

A prior art reference anticipates the claimed invention under 35 U.S.C. § 102 only if every element of a claimed invention is identically shown in that single reference, arranged as they are in the claims. *In re bond*, 910 F.2d 831, 832, 15 U.S.P.Q.2d 1566, 1567 (Fed Cir. 1990). All limitations of the claimed invention must be considered when determining patentability. *In re Lowry*, 32 F.3d 1579, 1582, 21 U.S.P.Q.2d 1031, 1034 (Fed Cir. 1994). Anticipation focuses on whether a claim reads on the product or process a prior art reference discloses, not on what the

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reference broadly teaches. *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 218 U.S.P.Q. 781 (Fed. Cir. 1983).

Applicants respectfully submit that Rockwell does not teach every element of the claimed invention arranged as they are in Claim 23. Specifically, Rockwell does not teach a robot having a barcode scan engine with a scan path having a scan path width controlled by an attenuation surface. Rockwell, in fact, does not teach an attenuation surface, let alone a scan path having a scan path width that is controlled by such an attenuation surface. In addition, Rockwell does not teach determining a second parallel position at which the target first becomes unreadable by the barcode scan engine.

According to its Abstract, Rockwell teaches a media handling system that includes a data cartridge processor having an opening to receive a data cartridge. The data cartridge processor functions to read data from or record data to the data cartridge. The system also includes a gripper for inserting the data cartridge into the opening and an actuator to effect movement of the gripper. A code symbol is affixed to the data cartridge processor and a code reader is associated with the gripper to read the code symbol for locating the opening of the data cartridge processor.

Figure 1 of Rockwell is shown below:

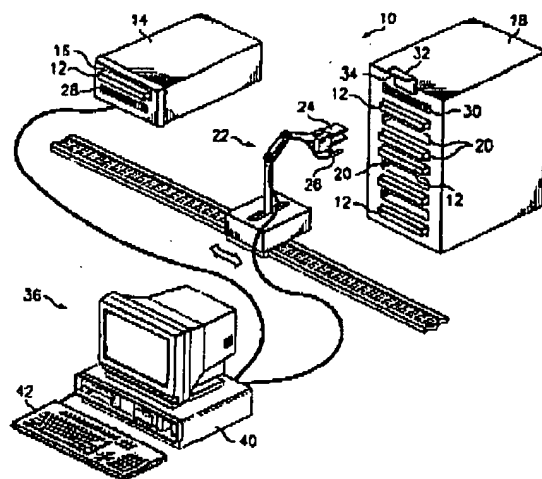


Fig. 1

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In **Figure 1**, Rockwell teaches a gripper 22 to which fingers 24 and code reader 26 are affixed. The gripper 22 is provided to move cartridges between a processor 14 and a storage rack 18. However, Rockwell does not teach moving a robot, wherein the robot also includes a barcode scan engine with a scan path having a scan width controlled by an attenuation surface. The gripper 22 in **Figure 1** does not have any attenuation surface affixed to or included in it. Rockwell, in fact, does not teach anything about an attenuation surface for use with a robot, let alone an attenuation surface for controlling the width of a scan path. While the path between data cartridge processor 14 and storage rack 18 may be interpreted to be a scan path, Rockwell still does not teach an attenuation surface that is used to control the scan path width of the scan path.

To the contrary, at column 1, lines 21-34, Rockwell teaches a system controller 36 having an output for controlling an actuator 38. The system controller 36 comprises computers, workstation, mini-computer, mainframe or other computing device 40. Thus, the nature of the mechanism that controls the scan path in Rockwell is different from the presently claimed invention, in that Rockwell uses a system controller 36, which is a computing device, to control the movement of gripper 22. In Claim 23, the attenuation surface controls the scan path width of the scan path of a barcode scan engine. However, in Rockwell there is simply no attenuation surface that controls the width of the scan path. Rockwell uses a computer to control the movement of the gripper, whereas Claim 23 recites a physical blockage, i.e., the attenuation surface, to control the width of a scan path.

The Office Action also alleges that Rockwell teaches positional features of Claim 23, at column 3, lines 35+. Rockwell, col. 3, line 35 through col. 4, line 7, reads as follows:

Referring to **FIG. 3**, the media handling system 10 determines offset distances 44 and 45 between the code reader 26 and the fingers 24 with respect to where the code reader 26 is reading. The distances 44 and 45 are determined using one of the code symbols 28 and 30 and the touch stop 34. For example, the code symbol 28 is affixed to the data cartridge processor 14 so that an edge 46 of the code symbol 28 is located known distances 48 and 49 from edges 50 and 51, respectively, of the touch stop 34. The distances 48 and 49 are stored in the memory of the computing device 40 of the system

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controller 36 through the operator keyboard 42. Using the fingers 24, the gripper 22 locates the edges 50 and 51 of the touch stop 34 and stores the location of edges 50 and 51 in the memory of the computing device 40. Additionally, the code reader 26 scans or reads the code symbol 28 and stores the location of the edge 46 of the code symbol 28 in the memory of the computing device 40. The system controller 36 calculates the distance 44 and 45 using the measured distances between the edge 46 and the edges 50 and 51 as determined using the code reader 26 and the fingers 24 and the known distances 48 and 49 stored in the memory of the computing device 40. Thus, the media handling system 10 accurately position the fingers 24 of the gripper 22 using the code reader.

Once the distances 44 and 45 between the code reader 26 and the fingers 24 are determined, the system controller 36 accurately locates each data cartridge processor 14 and storage rack 18 in the media handling system 10 using the code reader 26. For example, the code system 28 is affixed to the data cartridge processor 14 so that the edge 46 of the code system 28 is located a predetermined distance from the opening 16. This predetermined distance is stored in the memory of the computing device 40 of the system controller 24 through the operator keyboard 42. By locating the edge 46 of the code symbol 28, distances 44 and 45 are used to accurately align the fingers 24 with the opening 16 of the data cartridge processor 14. Additionally, each compartment 20 of the storage rack 18 will be accurately located in the similar manner using code symbol 30.

Figure 3 of Rockwell is shown below:

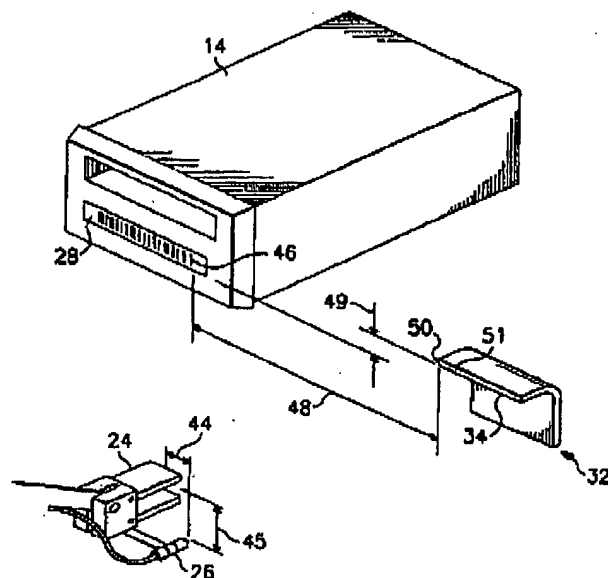


Fig. 3

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In the above section, Rockwell teaches measuring distance 48 by locating edge 46 of code symbol 28 and edge 50 of touch stop 34. Distance 48 between these two edges is parallel to the movement of the gripper 22. Edge 46 is only one end of code symbol 28. Therefore, Rockwell only teaches determining a first parallel location of code symbol 28. Rockwell does not determine a second parallel location of code symbol 28. Therefore, Rockwell fails to teach the feature of determining a second parallel position at which the target first becomes unreadable by the barcode scan engine, as recited in Claim 23.

Claim 29 is directed to subject matter similar to that of Claim 23, and is considered to distinguish over Rockwell for the same reasons given in support thereof.

For at least all of the above reasons, Applicants respectfully submit that Rockwell does not teach or suggest all of the features of Claims 23 and 29. At least by virtue of its dependency on Claim 23, Rockwell does not teach or suggest the features of dependent Claim 26. Accordingly, it is respectfully requested that the Board reverse the Examiner's final rejection of those Claims 23, 26 and 29.

C. GROUND OF REJECTION 3 (Claims 24-25, 27-28 and 30-34)

Claims 24-25, 27-28 and 30-34 stand rejected under U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,138,909, to Rockwell et al.

Regarding Claims 24-25, 27-28 and 30-34, the Office Action of June 6, 2005 states:

Re claims 24, 25, 27, 28, and 30-34, as shown in figure 3, the robot retrieves/deposits a data cartridge relying on positioning the device according to offset value 44, and 45 from the (col. 3, lines 35+). Location of the left edge 46 is stored along with the barcode information (col. 3, lines 49+). Although not explicitly suggested, it is obvious to one ordinary skill in the art to store location of right edge, or calculate center/mid point using locations of right and left edges.

Office Action dated June 6, 2005

While Rockwell teaches determining the location of one edge of a code symbol, Rockwell does not teach or suggest determining the center of the target in the parallel direction (Claims 24, 30), assigning a position halfway between first and


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second parallel positions as the center position of the target in the parallel direction (Claims 25, 31), determining the center of the target in the perpendicular direction from the first and second perpendicular positions (Claims 27, 33), or assigning the midpoint between the first and second perpendicular positions as the center of the target in the perpendicular direction (Claims 28, 34).

As described in previous arguments presented for claims 23 and 29, Rockwell does not teach or suggest determining the location of a second parallel location of the target. It would not have been obvious to one of ordinary skill in the art to determine the center of the target by assigning a position halfway between first and second positions, because without first determining the location of the second edge of the target, the center or midpoint of the target may not be determined.

In addition, a person of ordinary skill in the art would not have been motivated by Rockwell to determine the location of the second edge, since Rockwell is only concerned with using one edge of the code symbol to measure the distance between the code symbol and the touch stop. Rockwell is not concerned with determining the center or midpoint of the code symbol. Therefore, a person of ordinary skill in the art would not be motivated to determine the location of the second edge of the code symbol in order to determine the center of the target, without the disclosure of the Applicants.

For at least all the above reasons, Claims 24-25, 27-28 and 30-34 are respectively considered to distinguish over the Rockwell patent. Accordingly, it is respectfully requested that the Board reverse the Examiner's final rejection of those claims.


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CLAIMS APPENDIX

The text of the claims involved in the appeal are:

1. A robot, the robot comprising:
a barcode scanner with a scan path, wherein the barcode scanner is affixed to the robot;
an attenuation surface affixed to the barcode scanner, wherein the attenuation surface is located such that at least one end of the scan path of the barcode scanner is controlled by the attenuation surface to form a controlled end of scan, and wherein the controlled end of scan is used to determine a location of the attenuation surface with respect to a target associated with at least one storage cell within a storage library.
2. The robot as recited in claim 1, wherein the attenuation surface comprises a plurality of edges and wherein at least one of the edges are beveled.
3. The robot as recited in claim 1, wherein the attenuation surface is constructed from a material that is formable into sharp edges.
4. The robot as recited in claim 1, wherein the attenuation surface reflects light from a scanner illumination source in a non-detrimental manner.

5. The robot as recited in claim 1, wherein the attenuation surface controls one or more ends of the scan path during movement of the robot parallel to the scan path in order to determine a target position in a first coordinate frame.
6. The robot as recited in claim 1, wherein the movement of the barcode scanner substantially orthogonal to the scan path will determine the target position relative to positional data from the robot in a second coordinate frame.
7. The robot as recited in claim 1, wherein the target is a barcode.
8. The robot as recited in claim 1, wherein the attenuation surface comprises a metal.
9. The robot as recited in claim 1, wherein the attenuation surface is black anodized.
10. The robot as recited in claim 1, wherein the barcode scanner is a laser scanner.
11. The robot as recited in claim 10, wherein the laser scanner comprises:
a laser; and
a moveable reflecting surface which reflects light from the laser to an object external to the laser scanner.

15. A positional determination device, the device comprising:
a barcode scanner with a scan path affixed to a moveable object;
an attenuation surface affixed to the barcode scanner, wherein the attenuation surface is located such that at least one end of the scan path is controlled by the attenuation surface to form a controlled end of scan, wherein the controlled end of scan is used to determine a location of the object with respect to an external object.

16. A library storage system, the system comprising:
a plurality of storage cells, wherein at least some of the plurality of storage cells include a target;
a robot for moving items to and from the storage cells, wherein the robot includes a barcode scanner with a scan path, an attenuation surface, wherein the attenuation surface is located such that at least one end of the scan path is controlled by the attenuation surface to form a controlled end of scan, wherein the controlled end of scan is used to determine a location of the attenuation surface with respect to the target.

17. The library storage system as recited in claim 16, wherein at least one of the edges of the attenuation surface is beveled.

18. The library storage system as recited in claim 16, wherein the attenuation surface is constructed from a material that is formable into sharp edges.

19. The library storage system as recited in claim 16, wherein the attenuation surface is configured to reflect a scanner illumination source in a non-detrimental manner.
20. The library storage system as recited in claim 16, wherein the attenuation surface controls at least one end of the scan path during movement of the robot parallel to the scan path to determine target position in a first coordinate frame.
21. The library storage system as recited in claim 16, wherein the movement of the barcode scanner substantially orthogonal to the scan path determines the target position relative to positional data from the robot in a second coordinate frame.
22. The library storage system as recited in claim 16, wherein the target is a barcode.
23. A method for determining the position of a robot relative to a target, the method comprising:
- moving a robot, having a barcode scan engine with a scan path having a scan path width controlled by an attenuation surface, in a direction substantially parallel to the scan path;
 - determining a first parallel position at which the target is first readable by the barcode scan engine; and

determining a second parallel position at which the target first becomes unreadable by the barcode scan engine.

24. The method as recited in claim 23, further comprising:

determining the center of the target in the parallel direction from the first and second parallel positions.

25. The method as recited in claim 24, wherein the step of determining the center of the target in the parallel direction comprises assigning a position halfway between the first and second parallel positions as the center position of the target in the parallel direction.

26. The method as recited in claim 23, further comprising:

moving the robot in a direction substantially perpendicular to the scan path;
determining a first perpendicular position at which the target first becomes readable to the barcode scanner; and

determining a second perpendicular position at which the target first becomes unreadable by the barcode scanner.

27. The method as recited in claim 26, further comprising:

determining the center of the target in the perpendicular direction from the first and second perpendicular positions.

28. The method as recited in claim 27, wherein the step of determining the center of the target in the perpendicular direction comprises assigning the midpoint between the first and second perpendicular positions as the center of the target in the perpendicular direction.

29. A system for determining the position of a robot relative to a target, the system comprising:

first means for moving a robot₁ having a barcode scan engine with a scan path having a scan path width controlled by an attenuation surface₁ in a direction substantially parallel to the scan path;

second means for determining a first parallel position at which the target is first readable by the barcode scan engine; and

third means for determining a second parallel position at which the target first becomes unreadable by the barcode scan engine.

30. The system as recited in claim 29, further comprising:

fourth means for determining the center of the target in the parallel direction from the first and second parallel positions.

31. The system as recited in claim 30, wherein the fourth means comprises assigning a position halfway between the first and second parallel positions as the center position of the target in the parallel direction.

32. The system as recited in claim 29, further comprising:

fourth means for translating the robot in a direction substantially perpendicular the scan path;

fifth means for determining a first perpendicular position at which the target first becomes readable to the barcode scanner; and

sixth means for determining a second perpendicular position at which the target first becomes unreadable by the barcode scanner.

33. The system as recited in claim 32, further comprising:

seventh means for determining the center of the target in the perpendicular direction from the first and second perpendicular positions.

34. The system as recited in claim 33, wherein the seventh means comprises assigning the midpoint between the first and second perpendicular positions as the center of the target in the perpendicular direction.

EVIDENCE APPENDIX

There is no evidence to be presented.

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RELATED PROCEEDINGS APPENDIX

There are no related proceedings.